Spring 2014

College of Science and Mathematics Newsletter, Spring 2014

College of Science and Mathematics

The College of Science and Mathematics News

WRIGHT STATE UNIVERSITY

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Dean Yi Li

College of Science and Mathematics

Our Mission

To create passion for Science and Mathematics through evidence-based discovery, advancing knowledge of the natural world.

Hello friends, alumni, faculty, staff and students,

Spring is a time for celebration. The trees are blooming, the sky is blue again, and we do not need heavy jackets, scarves and boots. On April 24, 2014 we commemorated the "Women in Science Giving Circle, 5 Years of Giving," (see page 8). The Women in Science Giving Circle is an innovative philanthropic endeavor started by previous Dean of the College of Science and Mathematics, Dr. Michele Wheatly. The Circle has used its donations to fund scholarships and research for women in STEMM (science, technology, mathematics and medicine). Look for more information in future issues.

We have another exciting issue for you. The College of Science and Mathematics comes alive through our stories. I hope you enjoy reading about biology faculty Lisa Kenyon's cutting edge research about ways students can more deeply understand science (page 2); physics faculty Jason Deibel, our new Director of Undergraduate Research and Experiential Learning (DUREL, page 7); a successful event to highlight resources related to forging a career in the health professions, organized by Jacqui Neal, Director of Pre-Health programs (page 4); and the fascinating stories of talented alumni (throughout). And that is just a sample of what is inside. Read on…

Best,

Yi Li, Ph.D., Dean

Contents

Wright State researchers work to change traditional teaching model

From left, Wright State associate professor Lisa Kenyon and graduate students Jeannette Loyer and Mackenzie English are part of a National Science Foundation grant investigating how science is taught to grade-school students.

Memorize. Recite. Move on. That teaching formula may soon be a thing of the past.

Wright State University researchers are on the brink of helping change the traditional model for teaching science by making learning more meaningful for elementary and middle-school students and moving them into a higher form of reasoning.

Lisa Kenyon, Ed.D., associate professor of biological sciences and teacher education, is leading Wright State's effort as part of a five-year, $3.5 million grant from the National Science Foundation.

"We're trying to move past rote learning to a place where students investigate the knowledge and connect their ideas in order to deepen their understanding," Kenyon said. "We're attempting to make them more scientific thinkers."

Wright State, which is collaborating with Northwestern University, Michigan State and Wisconsin in the research, is in the fourth year of the grant and has a $350,000 share. Kenyon said she and three Wright State graduate student researchers are trying to help students participate in the construction of knowledge through the scientific practice of arguing over evidence or explaining a mechanism or using a model to show how and why something happens.

Conventional teaching about evaporation/condensation, for example, would entail the teacher writing down the definition, having students memorize it, giving them a worksheet and then testing them. "If you ask a student to explain evaporation/condensation, they can't get past the definition because they really don't understand it," Kenyon said.

Under the new method, the students are asked from where water comes and over a period of time must explore concepts, construct models, form a conceptual model in their heads and then explain how evaporation/condensation occurs. "It's pretty amazing because they collect data, then they learn they can revise and change their concept," Kenyon said. "So they are using a model as a thinking tool to help them figure things out."

She said the students do a deeper analysis of a scientific concept, not just agree with what is presented to them. They ask better questions, see that their opinions matter, take criticism well and become more confident and enthusiastic.

"We're attempting to make them more scientific thinkers."

~Kenyon

Learn more about Kenyon>>

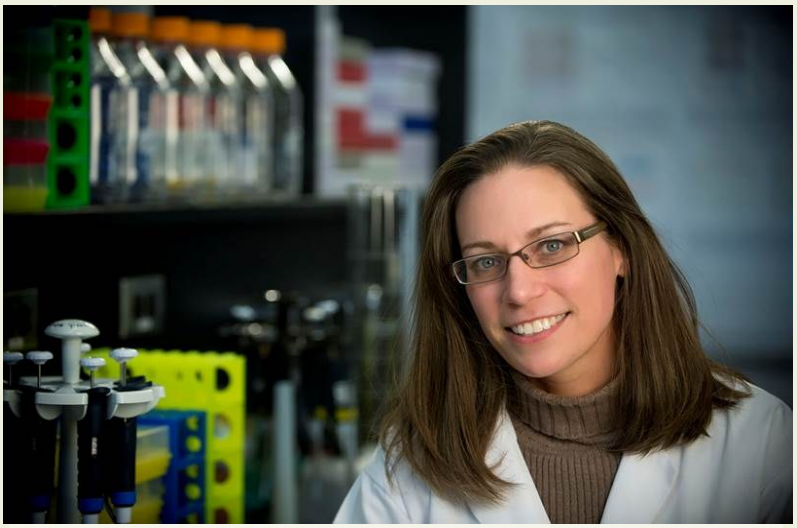
Visit the project's site>>

Nerve center: New neuroscience researcher brings unique talents, perspective

When she was 7 years old, Debra Ann Mayes found a Daddy Longlegs with a couple of legs missing. She kept it alive in the backyard of her home in the Ohio River town of Jeffersonville, IN, feeding it flies. When the spider's legs grew back, she was amazed.

A few years later, one of Mayes' cousins was in shop class and accidentally cut off her finger. Surgeons in Louisville were able to sew it back together, restoring feeling and movement.

"Not too long after that, I started hearing about spinal cord patients and wondered why damaged spinal cord couldn't grow back," said Mayes, an assistant professor of neuroscience, cell biology and physiology. "That was a huge question for me. Everybody told me it was impossible."



Wright State neuroscientist Debra Ann Mayes' current research focuses how to prevent and repair nerve damage from a disease that can cause behavior and developmental problems in children.

"Everybody here is doing hard core science, and everybody cares about what they are doing" ~Mayes

Mayes obtained her bachelor degree with honors in psychology from Indiana University, carrying a heavy load of neuroscience courses. She began working on her Ph.D. at the University of Arkansas, where she helped identify a molecule that advanced knowledge about the growth of nerves in the spinal cord. Then it happened. The 28-year-old researcher suffered a massive stroke, losing all sensation and motor movement on the left side of her body. She was rushed to the emergency room. "I told the neurologist, 'I'm having a stroke. These are my symptoms.' I wasn't all upset about it," Mayes recalled. "'He said, 'Why aren't you hysterical?' "I said, 'It's a stroke.' It was fascinating."

For a neuroscientist working on regeneration, having a stroke gave Mayes a window view from the inside out. During her rehabilitation, she was able to tap into the knowledge and experience of fellow patients with spinal cord injuries and also came to realize the key role physical therapy plays in recovering from nerve damage. "It brought up things I hadn't considered," she said. "It added layers to my knowledge I would not have gotten." It took Mayes—who has since regained virtually all of her sensation and motor skills—about two months to relearn how to walk.

Today, the newly hired researcher at the Wright State University and Premier Health Neuroscience Institute is working on making the impossible possible. Mayes' current project is to find out how to prevent and repair nerve damage from a disease that can cause behavior and developmental problems in children. But her project to-do list includes research into the neurology of the brain and the circulatory, skeletal and metabolic systems.

"Everybody here is doing good hard-core science, and everybody cares about what they're doing," said Mayes, who arrived at Wright State in August. "To be able to work in this environment allows you to flourish. There are so many projects that I want to do." **Learn more about NCBP>>**

visit the Pre-health Program for details>>

Path to Health Professions Day

Several hundred high school and college students interested in pursuing careers as doctors, nurses, veterinarians or other health professions converged on Wright State for presentations and tours.

The university hosted Path to Health Professions Day on Feb. 20 at the Student Union. Nearly 500 people registered for the event, including guidance counselors and parents.

“The purpose of this event was to provide information to future and current Wright State students about the health professions and programs available to them,” said Jacqueline Neal, director of the Pre-health Program at Wright State. “It also built relationships between Wright State undergraduate institutions with professional schools and admission representatives throughout Ohio.”

Another opportunity this career fair offers is allowing students to network and build relationships with admissions representatives. Hannah Vollmer, president of the Pre-Medical Society, whose members help out during the event, discussed how this day has helped her. “Last year I was able to meet an admissions officer from the optometry school at Ohio State University,” said Vollmer. “We got to sit down and have lunch together and it was a great opportunity for me to talk to him one on one and ask all of the questions I had. This will also help me when I apply in the future because he will hopefully be able to put a face to my name.”

Student Spotlight

The Biomedical Sciences program continues to recognize second year students with the highest GPAs. Three second-year students have perfect GPAs this year: **Ms. Lobna Elkhadragy, Mr. Amr Mahrous and Mr. Kevin Novak**. Congratulations!

Marjorie Markopoulos, Dr. Ioana Sizemore’s lab, was invited to the iRAMP Workshop February 8, 2014 with all expenses paid! The workshop is hosted by the American Chemical Society's (ACS) Divisions of Chemical Health and Safety and Chemical Information in conjunction with the ACS Task Force formed to identify and assess hazards in research laboratories. The workshop will be held on February 10 and 11 in Ithaca, NY to consider how publically available information on the Internet can be used to build a web-based tool which can support the control banding process, particularly in the academic teaching and research setting. This workshop is being supported by ACS Innovative Project grants received by the Divisions and the Task Force's annual budget.

Congratulations to Shannon Romer and **Adam Deardorff**, both from Dr. Robert Fyffe’s lab and the Biomedical Sciences PhD Program, for their publication being in the February 14th *Brain Research*, titled *Redistribution of Kv2.1 ion channels on spinal motoneurons following peripheral nerve injury*. Shannon’s image was chosen to be on the cover of the journal for this issue. Read more>>

Pavani Beesetty, 1st year BMS student in Dr. Kozak's laboratory, was a co-author on a presentation at the 58th Annual Meeting of the Biophysical Society, titled "Single-cell Na+ flux assay for measurement of TRPM7 channel activity".

Abigail Bolling, undergraduate psychology student, was awarded a $1,000 scholarship by Fairborn Lions Club President, Fred Pumroy. Abigail plays violin in the WSU Symphony Orchestra, which complements her long-term goal to help people using music therapy.

The Fairborn Lions Club selects two students with impaired vision annually based on their application essays. Robert Sabwami, rehabilitation services student, was also awarded. This marks the 39th consecutive year that scholarships have been presented to visually impaired students at Wright State University.

Energetic alumnus, Ben Sommerkorn, future researcher of renewable energy

It is no surprise that Ben Sommerkorn, a self-determined and energetic alumnus, has chosen to forge his path into the field of clean and renewable energy. Ben earned his Applied Mathematics BS Spring 2013. Through his dynamics and statics class he discovered his passion for the field of energy conversion. Weifu Fang, Ph.D., Chair of the Department of Mathematics & Statistics, approved Ben to take a few Mechanical Engineering classes. That is where he met professor James A. Menart, Ph.D., a mentor in Ben's path to studying clean energy. Ben's Applied Mathematics degree is excellent preparation for the required computational sciences skills of his graduate program. "A math degree contributes logic to engineering...it gives me an edge in real analysis to understanding concepts across disciplines, it's a powerful tool," states Ben.

As a first generation college student, Ben admits that he was challenged in navigating the university culture, yet he is quick to credit faculty and staff who in his words "lifted" him up. Menart, along with Tim Littell, MS. Ed., University College Assistant Dean, Dan Slilaty, Ph.D., Mathematics and Statistics, Associate Professor, and Joyce Howes, College of Science and Mathematics, Assistant Dean, all provided direction and counsel. Ben names "people resources" as a significant factor in his success, his gratitude to these individuals is palpable. "It's true that Ben appreciates the help he's received during his WSU years; but his unique gift is his ability to cultivate those relationships. Ben seeks help, listens to advice, then passes that advice on to other students," said Joyce Howes. "Ben is wicked smart, he'll make us proud."

Ben has been admitted into two Ph.D., programs; Northwest National Marine Renewable Energy Center (NNMREC) wave energy program at Oregon State University, and the University of California Riverside's program for thermal and fluid dynamics. Both are creating models that will develop and test renewable energy systems, wave conversion technology, solar, wind, and marine spatial planning that is mindful of habitat and socioeconomic impact. The west coast is ideally located to ocean and sunshine, with coastal populations for testing load capacity for this new research. This month, Ben will accept one of his graduate offers, and begin forging a new path in clean energy solutions and a new fulfilling career.

Biomedical Science Alumnus named as Graduate Student of the Year

Curt Grigsby, Ph.D., is the 2013-14 Biomedical Sciences (BMS) graduate student of the year. He was recognized at the annual Graduate Student Excellence Awards and Recognition Program on April 16th. Grigsby's thesis, entitled *"A Comprehensive Tool And Analytical Pathway For Differential Molecular Profiling And Biomarker Discovery,"* is significant for providing the framework for new and novel computer mathematical tools to analyze large and complex datasets from mass spectrometry (MS) and gas chromatograph mass spectrometry (GC-MS). Grigsby published six manuscripts and was a co-founder and chair of a bioinformatics symposium of the Ohio Systems Biology Working Group. Grigsby graduated with his Ph.D. December 2013.

Outstanding Alumni Awards

The College of Science and Mathematics Recipient

Jackie Mutschler attended Tecumseh High School in New Carlisle, Ohio where she was the Valedictorian of her graduating class. She was awarded an Honors Scholarship at Wright State, from which she graduated Summa cum Laude in 1984 with a B.S. in Geological Sciences/Geophysics Option and with Departmental Honors. Jackie pursued her graduate education at Cornell University supported by fellowships from the National Science Foundation and from Cornell.

Jackie began her career with BP in 1986. From her beginning as an exploration geophysicist, Jackie rose to become a Vice President within fifteen years. During that time she held geoscience, commercial and leadership roles that spanned the *Upstream value chain* including Sakhalin, Russia, North America gas, and Gulf of Mexico shelf and deepwater. Jackie also held project roles in strategic planning, organizational effectiveness, drilling & completions, supply chain management and digital business.

In 2006, she was promoted to Head of Upstream Technology. As Head of Upstream Technology, Jackie was responsible for delivering technology aligned with business strategy. This included responsibility for the research and development portfolio, technical specialists and technology collaborations that provide technology solutions to enable safe and reliable operations, to enable the development of new energy sources and to increase business value. Throughout her career, Jackie has placed an emphasis on building strong relationships with external stakeholders, as well as mentoring and developing diverse talent within BP. Jackie lives in Houston, Texas with her husband Doug (also a Wright State graduate) and their two teenage boys.

Graduate Studies Recipient

Tony Aretz received a Ph.D. in engineering psychology from the University of Illinois, Urbana-Champaign, a Master of Arts degree in Human Factors from Wright State University, and a Bachelor of Science degree from the USAF Academy. Tony has been the president of the College of Mount St. Joseph in Cincinnati, Ohio, since July 1, 2008. During his six years, he has led the Mount through a strategic planning effort, a comprehensive restructuring, the creation of ethical leadership and career readiness programs for all Mount undergraduate students, and the creation of new graduate and undergraduate programs, including the Mount's second doctorate program and its first fully online program.

He was the academic vice president at Christian Brothers University (CBU) in Memphis, Tenn., from 2004-2008. Prior to CBU, he was a lieutenant colonel in the U.S. Air Force, and member of the faculty at the USAF Academy where he was the founding director of the USAF Academy Scholars Program and director of academic strategic planning. Tony was a member of the USAF faculty for 17 years, teaching a variety of engineering psychology, human factors, leadership, research, and statistics courses.

Tony is currently a member of the board of trustees for Seton High School, the board of directors of Mercy Health Partners of Southwest Ohio, the executive committee of the board of directors of the Council of Independent Colleges, and the executive committee of board of directors of the Association of Independent Colleges and Universities of Ohio, among various other leadership positions in Cincinnati. Tony and his wife Terry have been married for 30 years and have three sons, Tommy, David, and Michael.

Jason A. Deibel, Ph.D. is appointed as Director of Undergraduate Research and Experiential Learning.

The College of Science and Mathematics is pleased to announce Jason Deibel, Ph.D., Associate Professor of Physics, as the first Director of Undergraduate Research and Experiential Learning.

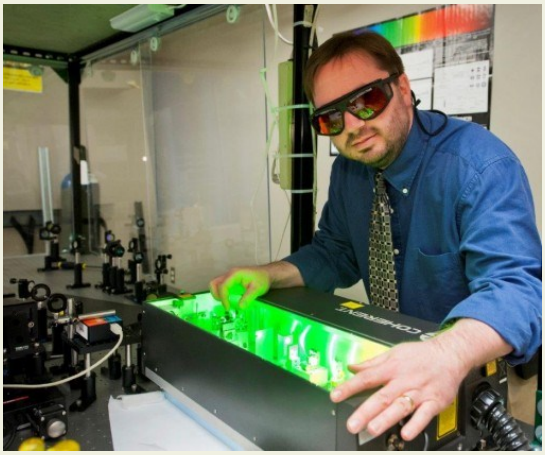
The Director of Undergraduate Research and Experiential Learning (DUREL) will promote and enhance undergraduate research opportunities both on- and off-campus. The DUREL will further develop internship and co-op programs and coordinate with the Honors Program, Pre-Health Program, and Career Services. In addition, the DUREL will ensure compliance with various research, regulation and compliance committees (Environmental Health and Safety, LACUC, and IBC).

"At the end of the day, what we're trying to do is advance the undergraduate experience for science and math majors at Wright State and better prepare them for careers down the road," said Deibel. "It's a more comprehensive experience—where not only are you learning, you are applying that knowledge."

His path to becoming a champion of undergraduate research began as an undergraduate at Transylvania University in Lexington, Ky., and a summer internship research opportunity at the University of Michigan's Center for Ultrafast Optical Science. Again, as a graduate student in applied physics at Michigan, he was able to supervise undergraduate research. And as a post-doc at Rice University, using lasers and optics in an unclassified CIA research program. "I knew how valuable undergraduate research was to me and also realized there could always be students on the cusp of not knowing what they want to do," he said. "Some people don't learn in a classroom setting; they learn by applying."

Deibel joined the Department of Physics at Wright State University in 2007. Prior to joining the faculty, he was a Postdoctoral Researcher at the Department of Electrical and Computer Engineering at Rice University where he was a Director of Central Intelligence Postdoctoral Fellow. During this time, he spent two months at the University of Leeds as a Royal Society Visiting Fellow.

Deibel completed his Ph.D. in Applied Physics from the University of Michigan, Ann Arbor and also holds a B.A. in Physics and Mathematics from Transylvania University. His research interests include ultrafast and terahertz spectroscopy and imaging, computational electromagnetics, and the characterization of novel materials. His work has been published in over 35 refereed journals and conference proceedings. A significant number of these publications have included undergraduate co-authors.



Learn More>> **Visit Deibel's research page>>**

Congratulation to new faculty on approval of $350K research funding!

Shulin Ju, Ph.D., and Quan Zhong, Ph.D., faculty researchers in the Department of Biological Sciences, have been approved for $350K funding to advance their project in biomedical sciences. Their project is entitled, "Developing a novel pipeline to identify human gene suppressors of cellular toxicity induced by proteins associated with neurodegenerative disease." Congratulations to Ju and Zhong for receiving this prestigious award.

The Women in Science Giving Circle commemorates 5 years of giving on April 24, 2014

The Women in Science Giving Circle is a philanthropic program in which donors pool their money to create opportunities to enhance the education and professional success of women in STEMM disciplines at Wright State University. Our current dean, Yi Li, is committed to continue support for women in STEMM. This renewed support along with the mark of our 5th year anniversary has been the impetus to reconnect with Circle members.

The Circle awards 100% of your donation to Wright State University female faculty, trainees, or students who are involved in STEMM; science technology engineering mathematics and medicine research or fields. With your past support, the Women in Science Giving Circle has had a large impact in the professional development of 26 Wright State women. During the past 5 years:

- 10 women faculty were awarded grants of $5,000 each, and
- 16 women students were awarded scholarships of $1,500 each
- for a total of $74,000 in awards

The 2014 Scholarship Recipients are:

- Kristina Burban - Chemistry
- Lauren Shafer - Biological Sciences
- Corrie Spradlin - Chemistry

WOMEN IN SCIENCE GIVING CIRCLE

Celebrating 5 Years of Giving

For more information call 937-775-3180, email wisgc@wright.edu, and visit our website: www.wright.edu/wisgc

Memorable Moments

Think back on memorable aspects of your studies within the College of Science and Mathematics. You may find your memories point to a single class, a particular test, or a classmate who sat next you each week. Other thoughts might call attention to a professor or staff member who helped identify an area of interest or passion for you to pursue as a career. Perhaps you can identify a research project or student internship that dramatically shaped your time at the university and led to a first job after graduation. Your memorable moments may cause you to recollect the significant impact a personal challenge you encountered had on your ability to go to school each academic term. Each of these memories holds value because they are a part of your Wright State experience.

As you think back on your memorable moments, please consider how you might positively impact the memorable moments of CoSM students today. You may be in a position to help provide an internship opportunity that will change a student's career trajectory. You may be in a position to provide modest or significant scholarship support that will allow a CoSM student to come to school, or stay in school. One of your memorable moments could provide a backdrop to put resources in place today so a student doesn't have a similar experience today.

Take a look at CoSM today. On a daily basis wonderful stories take shape as students and faculty make their own memorable moments. Your support of the college can make a tremendous difference to someone studying or working in CoSM today.

If you would like to share your memorable moments and learn how you can meaningfully engage the college today, please contact Chris Adkins-Lamb at 937-775-4980 or christopher.adkins-lamb@wright.edu.

Learn about CoSM areas of support<<<

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regarding this issue or to make suggestions for future content:
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This newsletter is published by the College of Science and Mathematics for its alumni, faculty, staff and friends.

College Events:

Department of Psychology Thesis Defense

"Fear of Discrimination and Leveraging of Leadership Experience in Individuals of LGBTQ Organizations"
Megan Morris
Friday, May 2, 2014 - 10:00 a.m. to 11:00 a.m.
Fawcett Hall 339A

"A Study on Psychological Contract Breach by the Supervisor"
Darrell Kelly
Tuesday, May 6, 2014 - 2:30 p.m. to 4:00 p.m.
Fawcett Hall 339A

Learn more>>

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Wright State University College of Science and Mathematics

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